Introduction to Costing HIV/AIDS Programs

POLICY Project

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Purpose

- Provide the basic knowledge needed to analyze and report program costs
  - Introduce basic concepts of costing
  - Examine real-life examples
  - Discuss issue specific to participants
  - Practice
  - Present costing tools and resources
  - Discuss follow-up and support needs

What are costs?

- Costs are the values of resources used to produce goods and services
- Familiar concept in daily life
- Need to define terms and decide how to report different types of costs

Costs to whom?

- Provider
  - Includes just costs to the provider
- Public sector
  - All public sector costs
- Society
  - Include private costs such as user fees, purchase of drugs

Types of cost (1)

- **Financial costs**
  - Actual *expenditure* on goods and services
  - Based on *price*
  - Salaries, purchased supplies, bus tickets
- **Economic** or opportunity costs
  - The *value* of goods and services
  - Donated goods and services: volunteer labor, free air time
  - Supplies whose prices are distorted: subsidized products
  - Capital items: buildings, vehicles

When to use

- Financial analysis
  - Prepare budget
  - Compare actual expenditure versus budget
- Economic analysis
  - Examine sustainability
  - Expand project to other area
  - Compare to other projects

Types of costs (2)

- Full costs
  - All resources used including infrastructure
- Incremental costs
  - New inputs required by intervention
  - Best when new activity is not a major component of organizations activities
  - Useful when capacity is under-utilized

Types of cost (3)

- Total costs
  - All project costs: R10,000
  - Useful for budgeting
- Average cost
  - Unit costs: R60 per client
  - Useful for reporting and when adding sites
- Marginal cost
  - Additional cost of one more unit of output
  - R20 per additional client
  - Useful when expanding services at existing sites

Joint costs

- Some costs may be shared across a number of interventions
  - Clinic treating STIs and providing other health services as well
- Allocate joint costs across all interventions on the basis of common unit of output
  - Proportion allocable to STI treatment = number of STI patient-visits / all patient-visits

Classification of costs (1)

- Capital costs
  - Items lasting longer than one year
  - Costing more than some cut-off level: $100
  - Examples: buildings, vehicles, equipment, long-term training, start-up activities
- Recurrent costs
  - Items used in the course of one year
  - Examples: personnel costs, supplies, vehicle operation and maintenance, building operation and maintenance, short-term training

Annualizing capital costs

- Annual cost of a capital item is calculated as a loan payment to buy the item
  - Current value, not original price
  - Useful lifetime
    - expected lifetime of product
    - duration of project if no residual value
  - Discount rate: real interest rate, 3-10%
- Use lifetime and discount rate to determine annualization factor

Annualization factors

	Discount rate							
Years	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10
1	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145

Calculate in Excel with

= -1*PV(Discount rate, lifetime, 1)

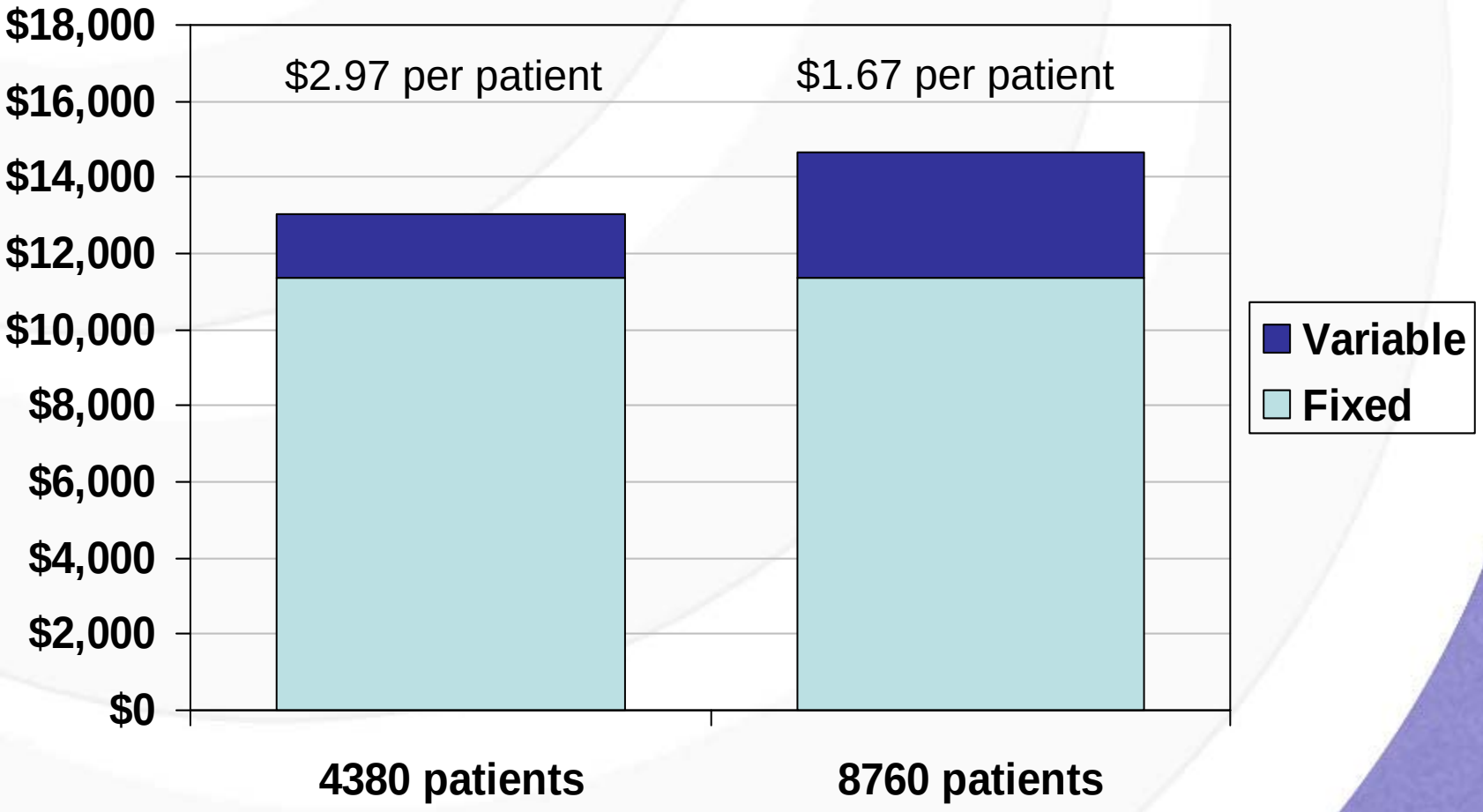
Annualization example

- Computer equipment for a clinic costs R10,000
- Useful lifetime is estimated as 5 years
- Discount rate is 5%
- Annualization factor is 4.329
- Annual cost = R10,000 / 4.329 = R2,310

Classification of costs (2)

- Fixed costs
  - Costs that do not change as the volume of services changes
  - Buildings, equipment, staff
- Variable costs
  - Costs that vary with the volume of services
  - Test kits, drugs, supplies

Scaling-up



Based on Harrison *et al. AIDS*, 2000; 14:2769-2779.

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Outcomes

- Primary
  - Infections averted, years of life saved
- Intermediate
  - Behavior change, decrease in viral load
- Immediate
  - Number of clients, number of condoms

Unit costs

- Unit cost = total cost / units of output
- Total cost
  - Financial or economic
  - Full or incremental
- Units of output
  - Immediate, intermediate or primary

Typical unit costs: prevention

Intervention	Unit cost	Units
Mass media	$4.26	Per adult reached
Education	$200	Per teacher trained
Youth peer outreach	$23	Per youth reached
Sex worker outreach	$20	Per sex worker reached
Condoms	$0.12	Per condom distributed
STI treatment	$11	Per STI case treated
VCT	$22	Per client
Blood safety	$4	Per unit of safe blood

Typical unit costs: care and treatment

Intervention	Unit cost	Units
Palliative care	$135	Per patient
OI treatment	$400	Per patient
OI prophylaxis	$70	Per patient per year
Laboratory monitoring	$16	Per patient per year
ARV, first line	$400	Per patient per year
ARV, second line	$2,000	Per patient per year

Multiple years

- When comparing costs across more than one year, translate results into constant currency
  - Use deflators such as Consumer Price Index to put all costs in currency of most recent year
  - CPI for South Africa (Metro areas, all items)
    - 2000: 100
    - 2001: 105.7
    - 2002: 115.4
    - 2003: 122.1
    - 2004: 123.8
    - 2005: 128.5 (approx.)

Source: StatsSA, www.statssa.gov.za

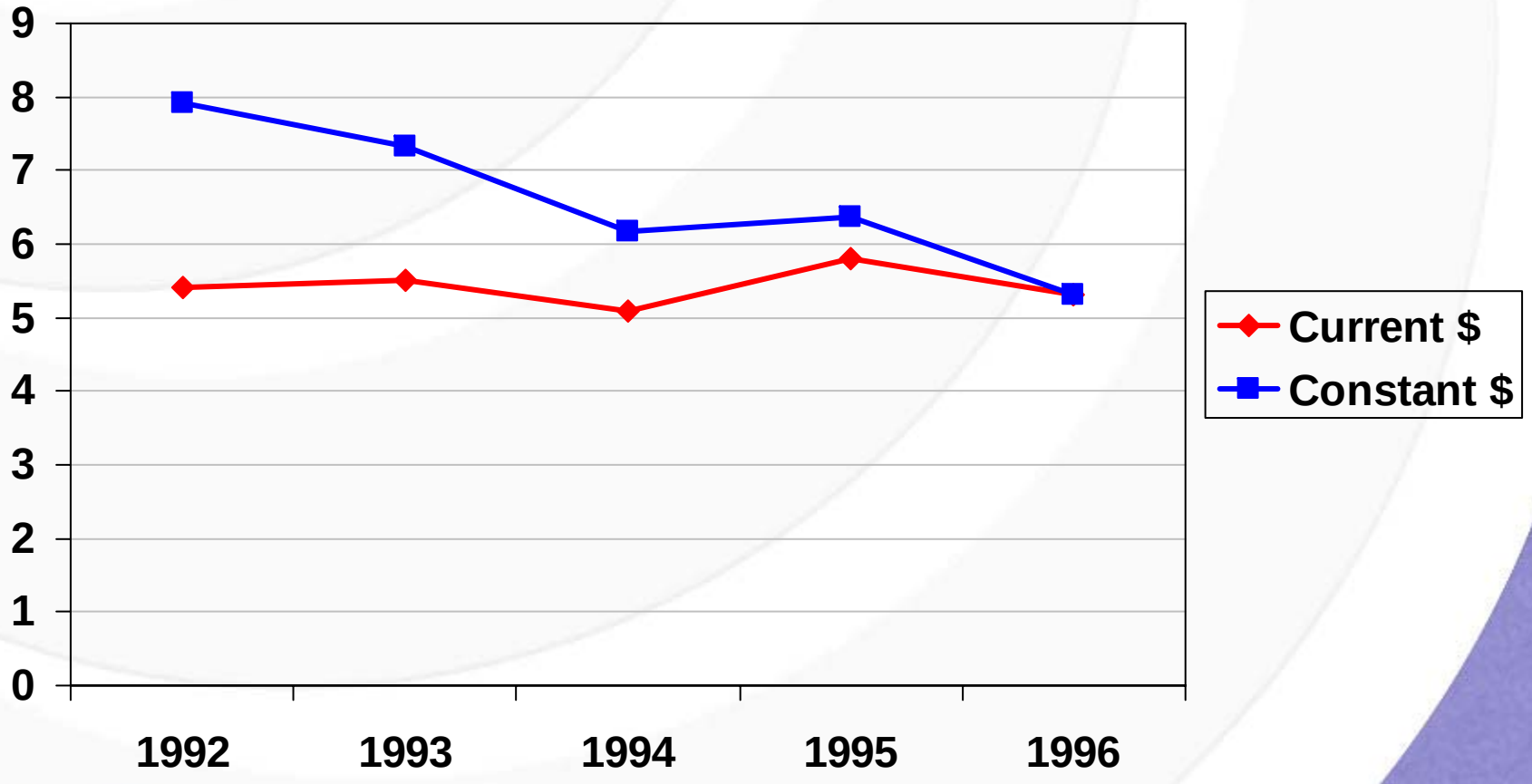
Deflating costs

Year	Actual expenditure	CPI	2005 Rand
2003	R10,000	122.1	R10,524
2004	R10,000	123.8	R10,380
2005	R10,000	128.5	R10,000

2003 expenditures in 2005 Rand = 2003 actual expenditure x 2005 CPI / 2003 CPI

2003 expenditures in 2005 Rand = R10,000 x 128.5 / 122.1 = R10,524

Cost per client in current and constant currency



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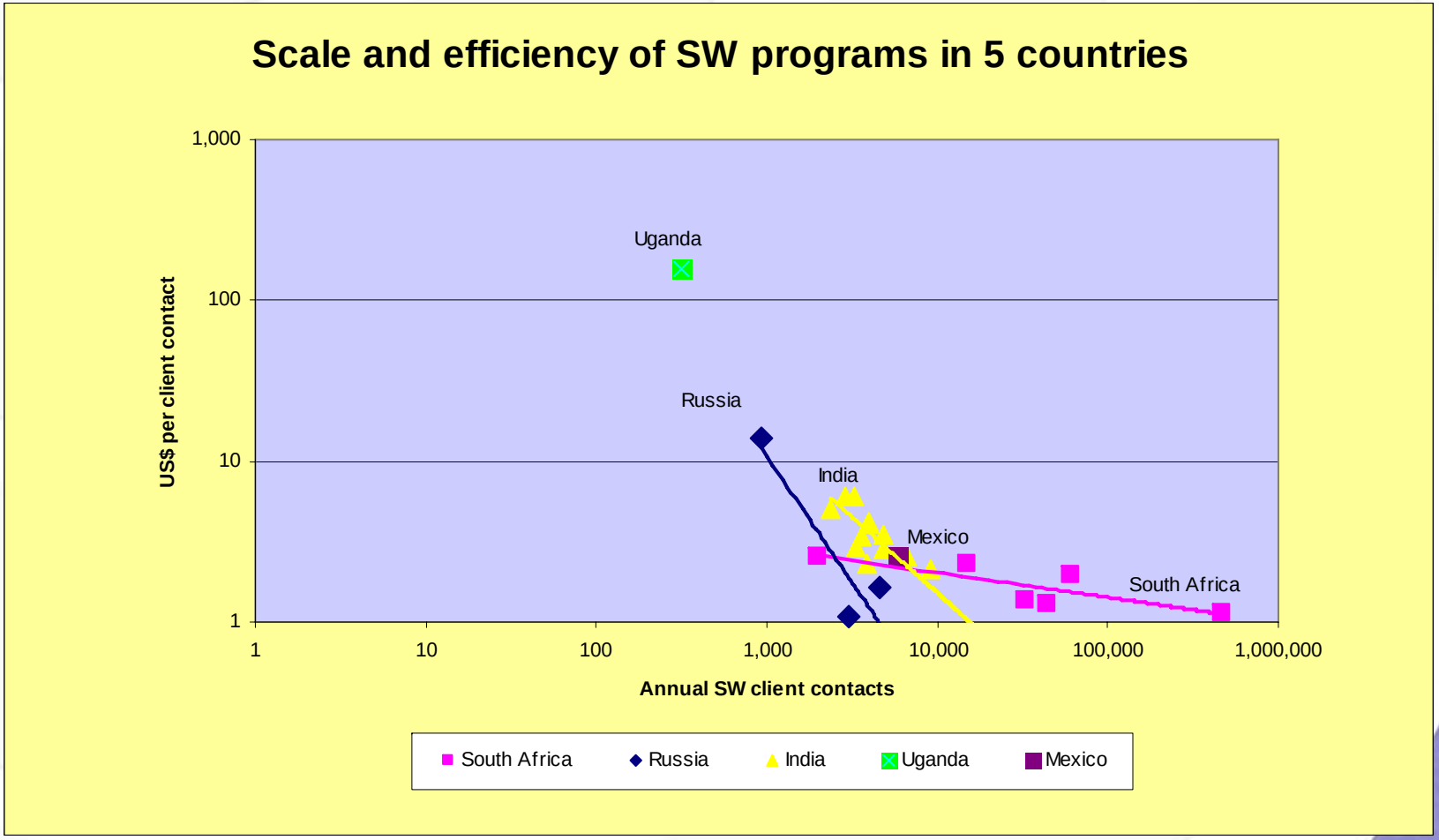
Using a common currency

- Reporting to USG in US dollars
- Converting US$ prices to Rand
  - Deflate first in US$, then convert to Rand

Economies of scale

- Unit cost may drop as scale expands if fixed costs are distributed across a larger number of units
- Unit cost may rise if more effort is needed to reach additional population
- Unit cost may not change with scale if other factors are more important than economies of scale

Unit costs for 26 SW sites



Source: B Hansl *et al.*Costing HIV Prevention: recent PANCEA data and results, Bangkok 2004.

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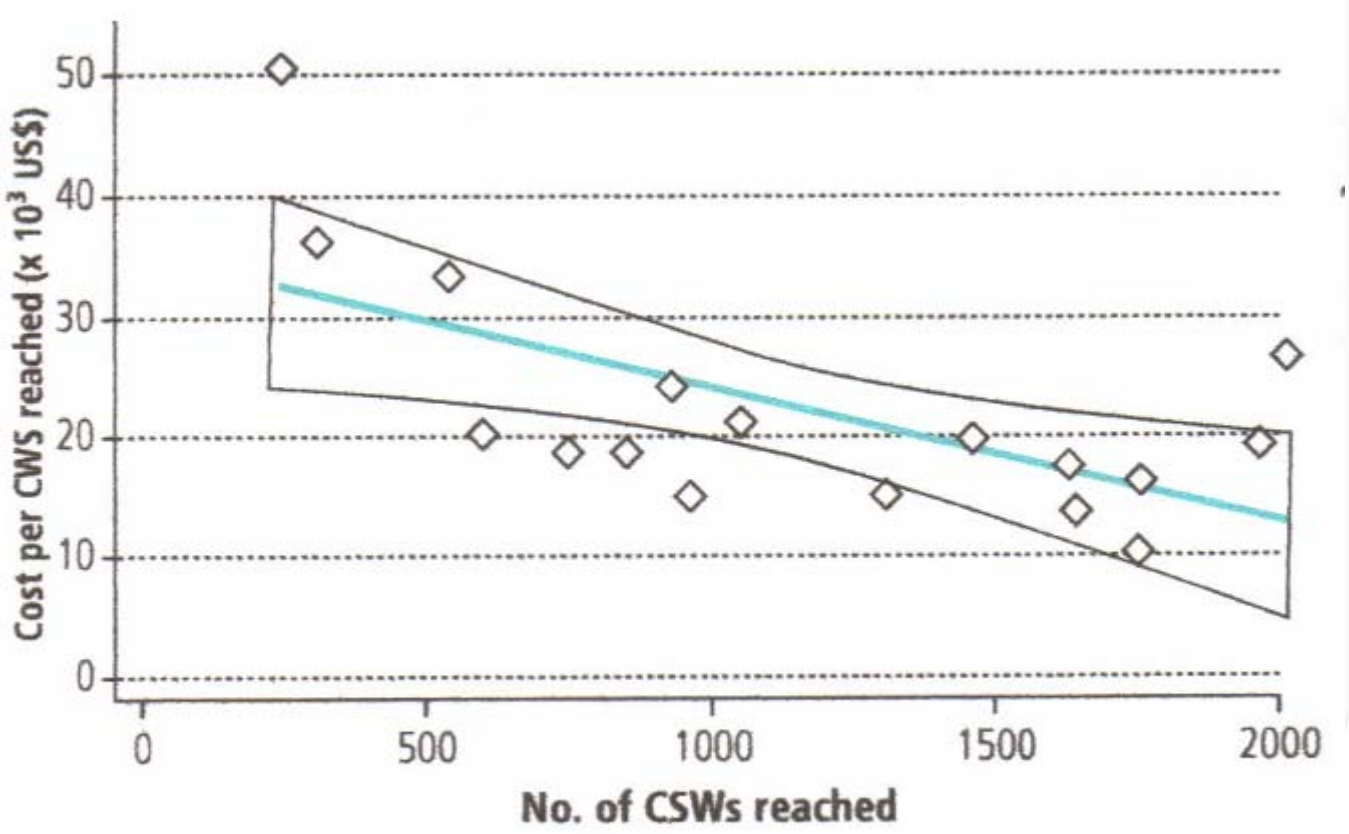
Sex worker outreach programs in India



Source: Guiness *et al.* Does scale matter? The costs of HIV prevention interventions for commercial sex workers in India. *Bull WHO* 2005;**83**:747-755.

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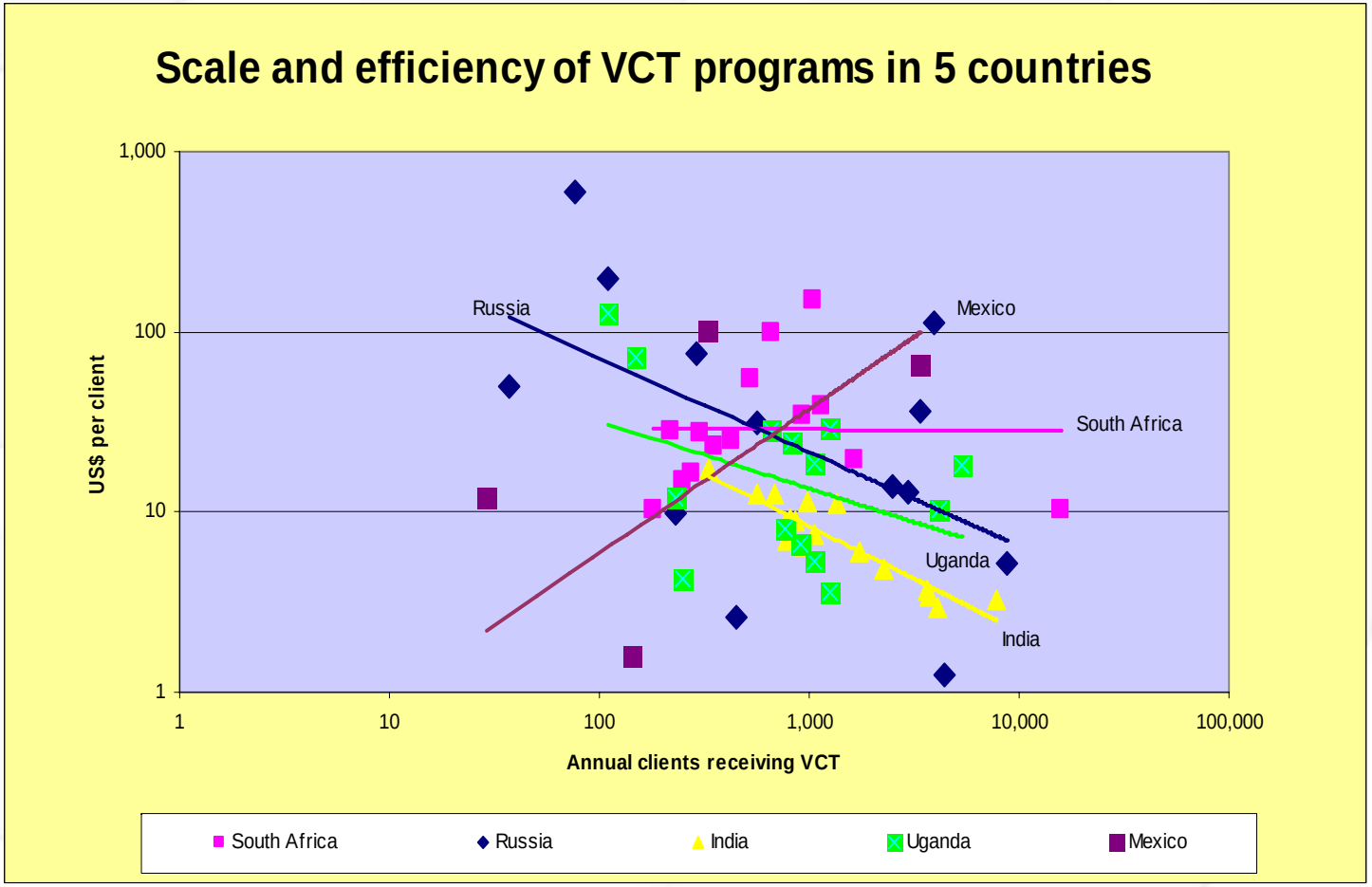
Unit costs for 63 VCT sites



Source: B Hansl *et al.*Costing HIV Prevention: recent PANCEA data and results, Bangkok 2004.

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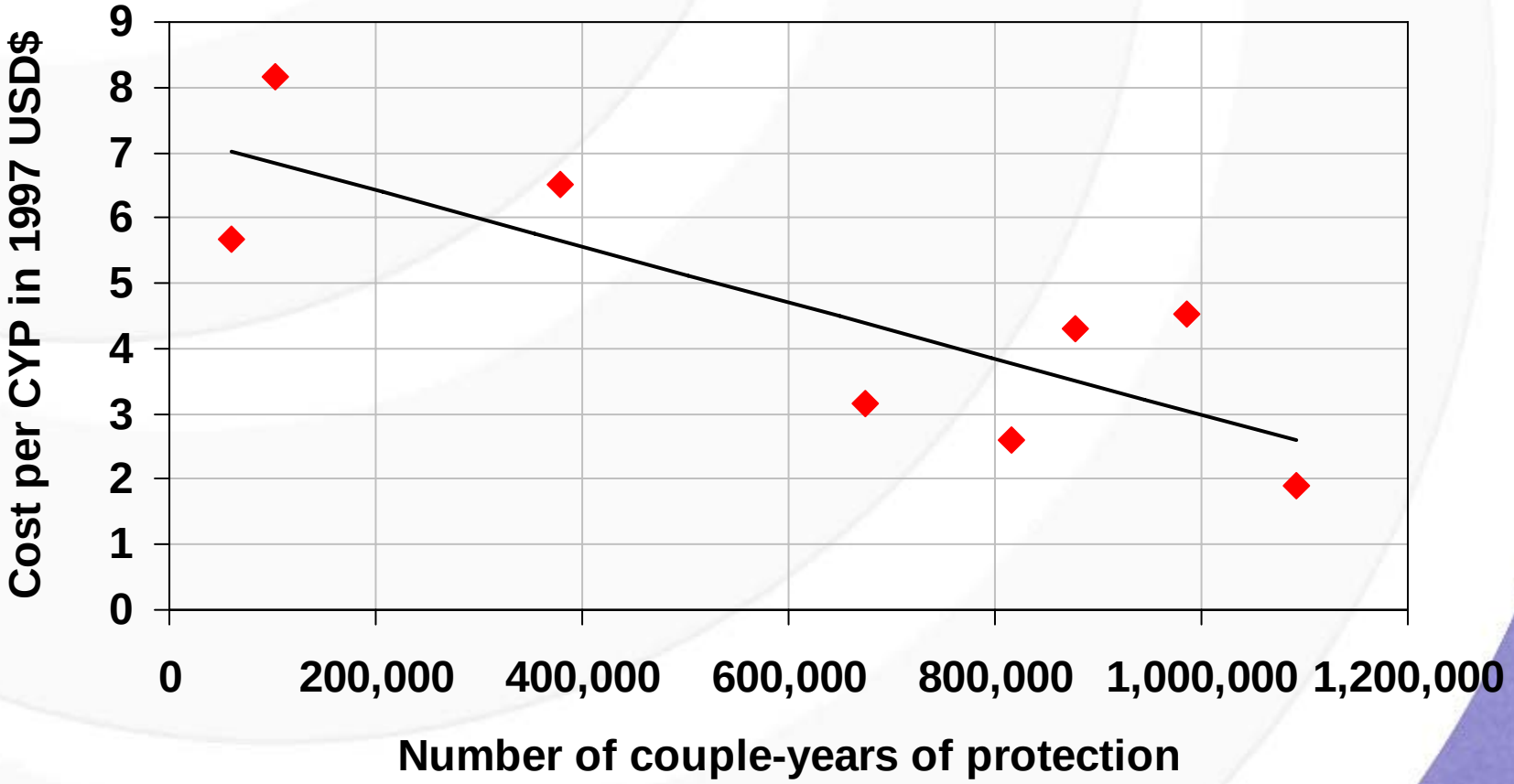
Economies of scope

- Unit costs may change as more services are added to a project
- Costs can drop if new services share fixed costs

Economies of scale and scope in social marketing of contraceptives



Source: Stover J and Heaton L. The Costs of Contraceptive Social Marketing Programs Implemented Through the SOMARC Project. SOMARC/Futures Group, 1997.

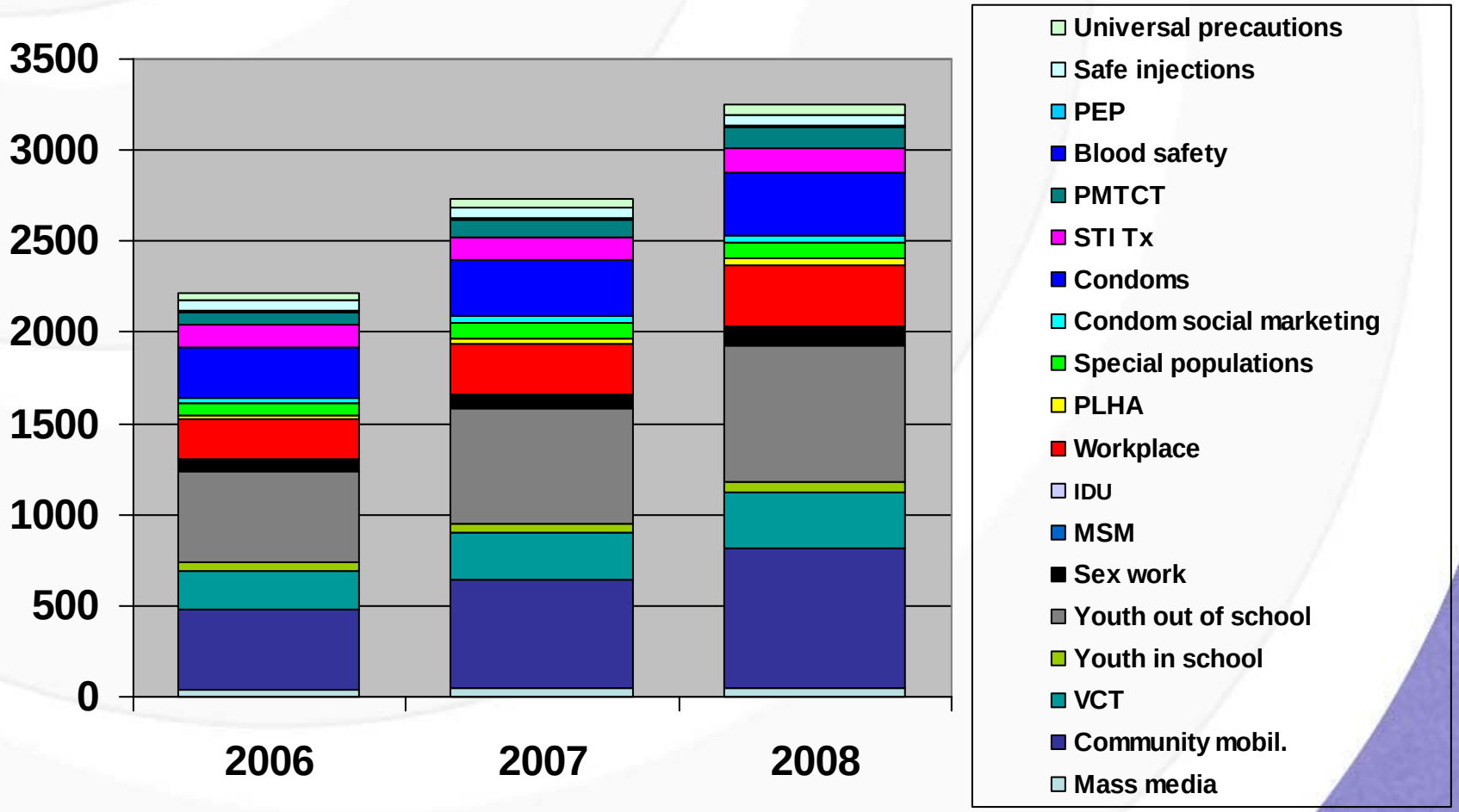
Types of economic analysis

- Total cost
  - What resources are needed?
- Cost-effectiveness analysis (CEA)
  - How does this compare to other prevention interventions?
- Cost-utility analysis (CUA)
  - How does this compare to other health interventions?
- Benefit-cost analysis (BCA)
  - How does this compare to other public interventions?

Total cost

- **How much will it cost?**
  - Training, facilities, staff, equipment, counseling, screening, IE&C, side effects, monitoring
  - Financial versus economic costs
- **Can we afford it?**
  - Gross costs vs net costs
    - User fees
    - Expenditure avoided ($2600-$4200)
  - Incremental costs versus full costs
  - Who pays: public sector, out-of-pocket, donors

Resources Required for Prevention in sub-Saharan Africa (Millions US$)



Source: Resource needs for an expanded response to AIDS in low- and middle-income countries, UNADS, August 2005.

Cost-effectiveness

- **Is this a good investment compared to other *HIV prevention interventions*?**
- Cost per infection averted
  - Need information on number of infections averted
    - Primary
    - Secondary

Cost-effectiveness studies

Intervention	$/infection averted	Location
Syndromic management of STIs	$217	Tanzania
Safe blood supply	$172	Uganda
VCT	$241 - $303	Kenya, Tanzania
PMTCT	$2517	SSA

STI: Attawell and Grosskurth, 1999. Blood: Winsbury, 1995.
VCT: Sweat *et al.* 2000. PMTCT: Sweat 2004.

Cost-effectiveness from modeling

Intervention	Cost/infection averted
Mass media	$58
Peer ed for sex workers	$70
Peer ed and STI tx for SW	$58
School-based education	$6700-9450
VCT	$1300
STI treatment	$300

Hogan, Baltussen, Hayashi, Lauer, Salomon. 2005. Cost-effectiveness analysis of strategies to combat HIV/AIDS in developing countries *BMJ*, doi:10.1136./bmj.38643.36892.68 (published Nov 10 2005)

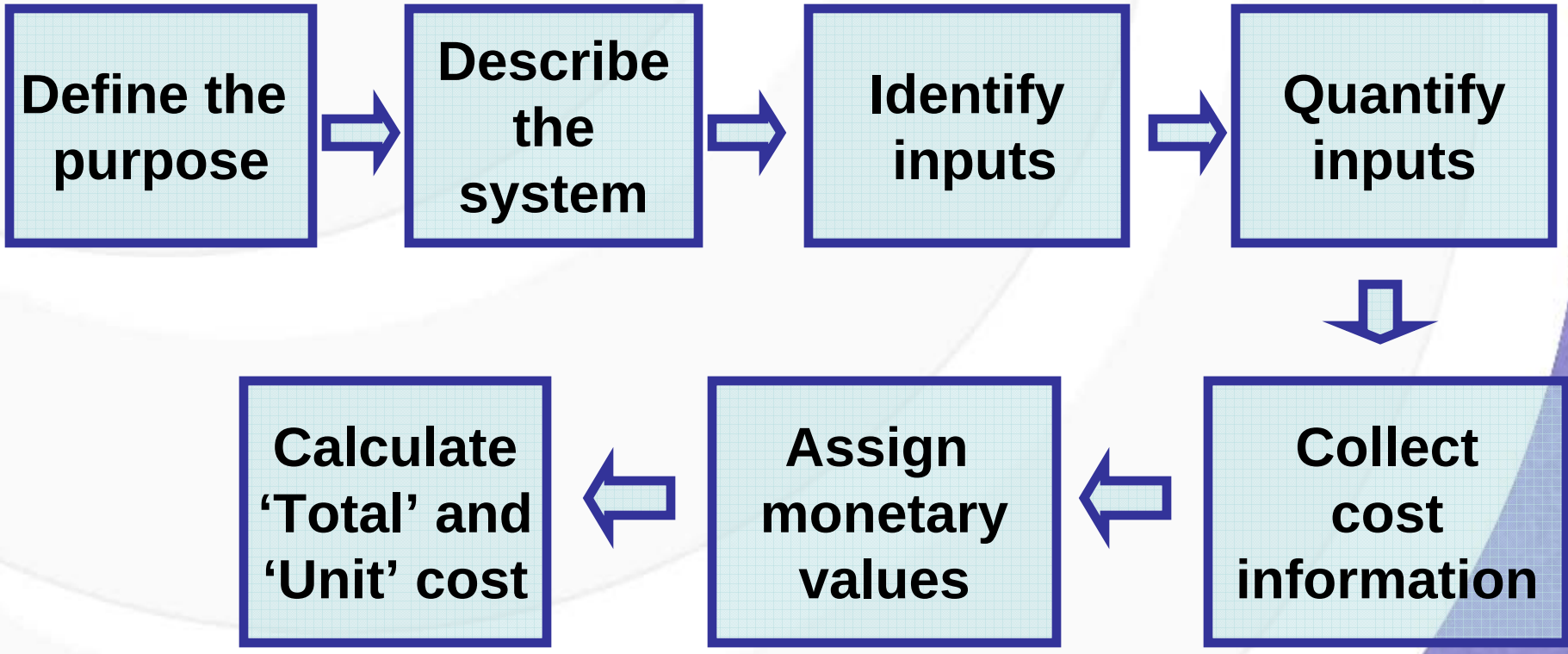
Cost utility analysis

- **Is this a good investment compared to other *health interventions*?**
- Cost per quality adjusted life year
  - HIV infections averted by age and sex
  - Life expectancy with HIV (w/wo ART)
  - Quality of life with HIV
  - Other health benefits

Benefit-cost analysis

- **Is this a good investment compared to other *public interventions*?**
- Benefit/cost ratio
  - Benefits of avoiding infection or gaining extra years of life to individual, family, community, nation
  - Include benefits and disadvantages

Costing Process



Planning a costing exercise

1. Define objective
   - Reporting to funder or board
   - Identify potential cost savings
   - Budgeting
   - Monitoring
   - Planning improvements

Planning a costing exercise

2. Define question
   - Are we losing money on this activity?
   - Can we expand the scale or scope?
   - Should we charge a user fee? How much?
   - Can we replicate the project elsewhere?
   - How much funding do we need for next year?
   - How can we best allocate our resources?

Categorizing Costs

- Marginal cost vs. Average cost
- Fixed cost vs. Variable cost
- Capital cost vs. Recurrent cost

Planning a costing exercise

3. Describe what you are costing
   - VCT
   - Integrated VCT, support, treatment
4. Decide on time frame
   - Usually one year
4. Identify sources of data
   - Costs and outputs
5. Collect data
6. Perform analysis

Collecting Cost Information

- Collect macroeconomic data (interest rates, inflation rates, property values)
- Identify all recurrent resources used (including donated items)
- Identify all capital items used
- Annualise capital costs
- Identify joint costs
- Allocate joint costs

Reporting results

- Be clear about what you are reporting
  - Total costs, unit costs, financial or economic, currency, year
- More important than making the “right” assumptions is reporting the assumption you used

Mis-uses of costing data

- Factors other than cost must be considered in resource allocation decisions
  - The lowest cost intervention may not always be the “best”

Costing example: Social marketing of contraceptives (SOMARC)

- Questions
  - How much does it cost to provide one couple with family planning through social marketing?
  - How does the cost compare with other ways of providing family planning?
  - Do the costs change with scale?
  - Can programs become sustainable?

Costing example: Social marketing of contraceptives (SOMARC)

- Recurrent costs
  - Salaries: director, sales force
  - Office rent and operating costs
  - Packaging
  - Advertising development
  - Vehicle operating costs
  - Commodities: May be donated, use shadow price
  - Media: May be free, use shadow price

Costing example: Social marketing of contraceptives (SOMARC)

- Capital costs
  - Vehicles
  - Computers, fax, copiers, telephones
  - Start-up costs
    - Brand name creation, focus group testing

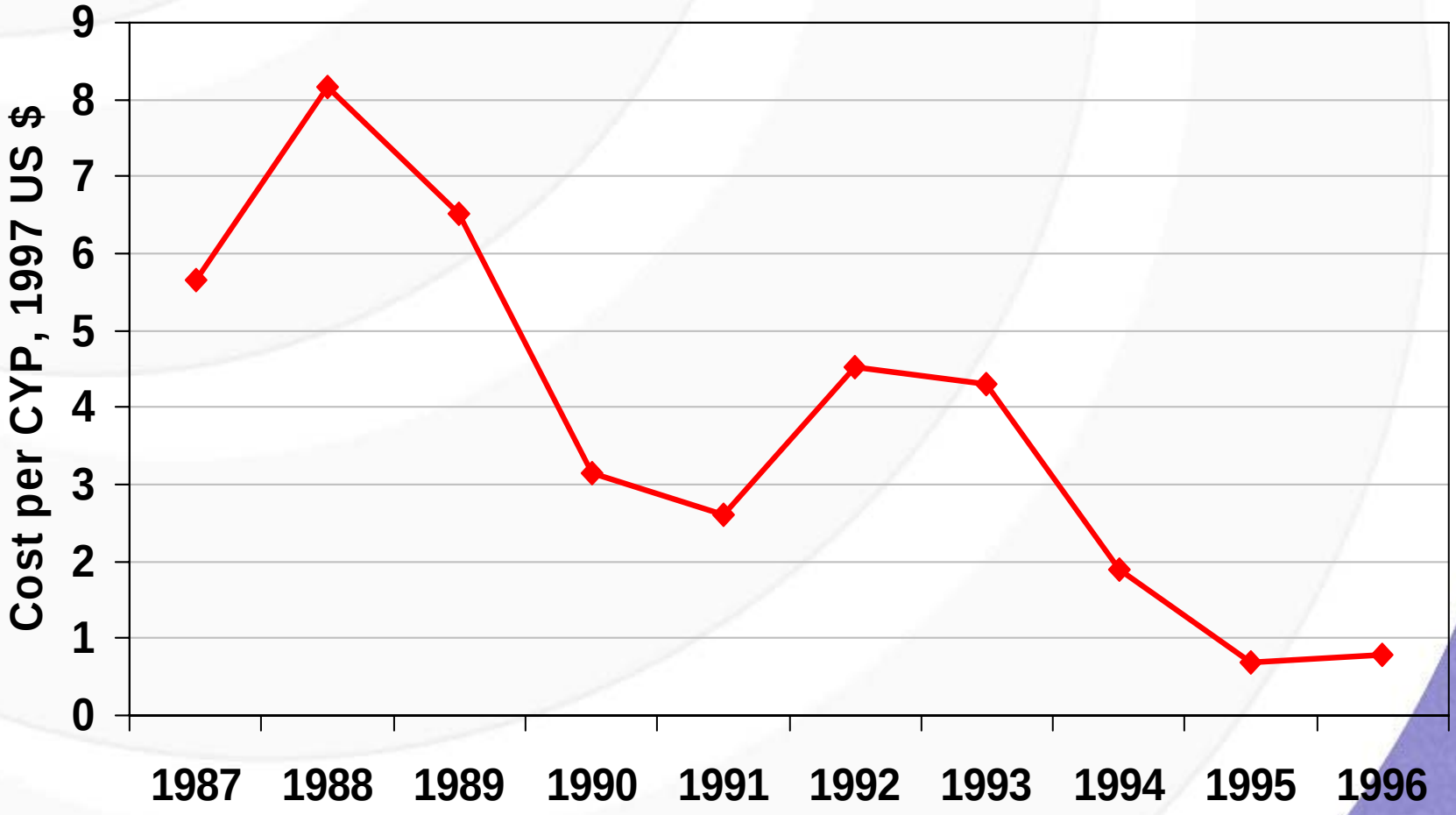
Costing example: Social marketing of contraceptives (SOMARC)

- Key issues
  - How to account for home office costs?
    - Allocate across all country projects
  - Include costs of social marketing library?
    - No
  - How to allocate common costs?
    - Couple-years of protection
  - Include client payments as reduction in costs

Costing example: Social marketing of contraceptives (SOMARC)

- Indicators reported
  - Local cost per CYP
  - Local cost plus home office overhead
  - Cost per CYP per year
  - Cumulative cost per CYP
- Analyses: Cost per CYP
  - by country
  - by year
  - by volume
  - by project duration

Cost per CYP


Cost per CYP, 1997 US $
9
8
7
6
5
4
3
2
1
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996

Resources

- Costing Guidelines for HIV Prevention Strategies, UNAIDS, Geneva, Switzerland, 2000.
  - http://www.unaids.org/html/pub/publications/irc-pub05/jc412-costguidel_en_pdf.pdf
- Costing Guidelines for HIV/AIDS Prevention Intervention Strategies, UNAIDS/ADB, February 2004
  - http://www.unaids.org/html/pub/publications/irc-pub06/jc997-costing-guidelines_en_pdf.pdf
- Cost-effectiveness analysis and HIV/AIDS, UNAIDS Technical Update, August 1998
  - http://www.unaids.org/html/pub/publications/irc-pub03/costtu_en_pdf.pdf
- HIV/AIDS Home-based Care Costing Guidelines, Natasha Hsi, Stephen Musau, Catherine Chanfreau, Abt Associates, August 2005
  - www.phrplus.org/Pubs/Tool019_fin.pdf
- International AIDS Economic Network (IAEN)
  - www.iaen.org
- Cape Town ART Costing Model
  - aboulle@phfm.uct.ac.za
- AIDS Treat Cost Model
  - www.phrplus.org
- Statistics
  - www.statssa.gov.za
- POLICY Project in South Africa
  - CWills@polproj.co.za